

PRENATAL EXPOSURE TO ORGANOCHLORINE COMPOUNDS AND ULTRASOUND MEASURES OF FETAL GROWTH

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Background and Aims: Prenatal exposure to some organochlorine compounds (OCs) has been associated with adverse pregnancy outcomes but no study has assessed OC exposure effects by using ultrasound measurements. To investigate the possible association between fetal growth and maternal (n=485) and cord (n=490) concentrations of some OCs, including 4,4'-DDT, 4,4'-DDE, hexachlorobenzene (HCB), β -hexachlorocyclohexane (β -HCH), 4 polychlorinated biphenyl (PCB) congeners (118, 138, 153 and 180), and their sum (Σ PCBs) in a mother-infant birth cohort in Valencia, Spain.

Methods: We fit linear mixed models to estimate longitudinal growth curves for estimated fetal weight (EFW), abdominal circumference (AC), femur length (FL), and biparietal diameter (BPD) in each trimester of pregnancy. Standard deviation (SD) scores were calculated from longitudinal growth curves, adjusted for gestational age and potential growth determinants. Size at 12, 20, and 32 weeks was assessed by unconditional SD scores. We studied the association between fetal growth and maternal and cord OC concentrations by multivariate regression analyses.

Results: We found statistically significant inverse associations between EFW, FL and cord serum 4,4'-DDE concentrations at mid-pregnancy, and between EFW, AC and cord serum HCB or β -HCH concentrations at end-pregnancy. We found statistically significant inverse associations of FL and BPD with PCB 138 concentrations at the beginning of pregnancy and between AC, FL and PCB 153, 180 and Σ PCBs at mid- and end-pregnancy. The range of decrease for the four fetal parameters was between -5 and -14% for each 10-fold increase in the OC concentrations.

Conclusions: These results suggest that prenatal exposure to some OCs may impair fetal growth. This effect is mainly demonstrated during mid- and end-pregnancy, and OC measures in cord serum are, in general, a better biomarker of exposure to detect impairment of fetal growth. Ultrasound measures constitute a promising way to examine how early prenatal OC exposure affects fetal growth.